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Smokeless Tobacco—An Overview for Physicians

SUZANNE DANDOY, MD; GARY EDWARDS, MS, *and* GORDON LINDSAY, PhD, *Salt Lake City*

This is one of a series of articles from western state public health departments.

The cliché "history repeats itself" is all too true in the case of tobacco. While we are successfully reducing the prevalence of smoking, there is a resurgence in the use of smokeless tobacco. Dipping snuff and chewing tobacco are practices that have existed for centuries. Smokeless tobacco use faded after the invention of the cigarette-making machine in 1881, but such use is climbing dramatically into popularity again.

During the 17th and 18th centuries, snuff was the preferred mode of tobacco use in England. Snuff taking became an integral part of fashionable life in England and was openly practiced by both sexes.[1,2] By the mid-1700s, a man who did not take snuff was not considered a gentleman. Ladies took snuff as "artistically, vigorously and conspicuously as men and the method of taking snuff and the ritual of opening and tapping the box were reduced to a fine art."[1] Snuff also acquired a reputation as a powerful disinfectant and preventive agent against the plague.[1]

During the 1800s, tobacco chewing became known as "the American habit."[1] A communal snuff-box and cuspidors were installed for members of Congress, a practice that continued until the mid-1930s.[3] Maintaining spittoons cost taxpayers $400 a year.

Public outcry against unsanitary practices in the United States caused tobacco spitting to become socially unacceptable *and* unlawful in many public places. This factor, combined with the inexpensive mass production and successful marketing of cigarettes, led to a rapid decline in smokeless tobacco use. That decline has been reversed. Smokeless tobacco use has been on the increase since the early 1970s. Product sales have increased about 11% each year since 1974.[1] Much of the resurgence of smokeless tobacco can be attributed to a desire to use tobacco but to avoid the harmful effects of smoking.

The same skillful advertising techniques that have been used in the marketing of cigarettes are now used to promote smokeless tobacco products. Celebrities from many different sports are featured in smokeless tobacco ads. Youth-oriented movies portray "modern" cowboys or other "macho" characters who use smokeless tobacco as part of the tough-guy image.

One prime target area for the smokeless tobacco market is the American Southwest.[4,5] The Smokeless Tobacco Council claims advertisements are only used to create brand loyalty.[5] If that were true, the ads would concentrate on the quality of one product versus another, rather than promoting the image of the user. Instead, most smokeless tobacco ads contain a segment that shows a neophyte customer how to use the product. The US Tobacco Company Chair and President, Louis Bantle, estimated 80% to 85% of his company's customers were new users.[6] It is estimated that $10.2 million was spent in 1981 for promoting smokeless tobacco products, primarily through television and other broadcast media.[6]

Apparently the ads have been successful. While per capita sales of cigarettes have been on the decline, smokeless tobacco sales have increased. Estimates of current smokeless tobacco users range from 7 to 22 million nationally.[5,7,8]

Youth Prevalence

A survey conducted by the Utah Department of Health in late 1984 in five Utah public schools showed that 5% of 1,943 high school students used smokeless tobacco products during the past 24 hours and 8% used them during the previous week. Among male students, the figures were higher: 10% and 15%, respectively.

Smokeless tobacco use appears to be a social behavior. According to the National Institute on Drug Abuse, a strong relationship exists between an adolescent's chewing behavior and the chewing behavior of his or her friends.[9] This relationship was also seen in the Utah survey: 79% of the students who indicated having used a smokeless tobacco product within the previous 24 hours also reported that at least one of his or her two best friends was a user. Conversely, only 9% of those who reported never having used the products reported having a best friend who was a user.

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Dr Dandoy is Executive Director, Utah Department of Health; Dr Lindsay is Director, Statewide Risk Reduction, Utah Department of Health, and Mr Edwards is Coordinator, Tobacco Risk Reduction Program, Utah Department of Health, Salt Lake City.

Reprint requests to Gary L. Edwards, MS, Coordinator, Tobacco Risk Reduction Program, Utah Department of Health, PO Box 16700, Salt Lake City, UT 84116-0700.

Regular users (use in last 24 hours) and frequent users (use in previous week) were also more likely to report "purchase" as their method of procuring smokeless tobacco (63% and 45%, respectively). Such purchase is a violation of Utah's law restricting sale to those older than 19 years. Students appeared to begin experimenting with smokeless tobacco at a younger age (10.5 years) than with cigarettes (11.1 years). No significant differences in use were found between urban and rural areas.

Health Effects

The National Cancer Institute, World Health Organization, American Academy of Pediatrics, American Health Foundation and American Dental Association have accumulated a substantial body of evidence indicating that smokeless tobacco use increases the risk of oral cancer in humans. In fact, recent reports from the International Agency for Research on Cancer state that there is sufficient evidence to conclude that the oral use of snuff causes cancer in humans.[10,11] The first report linking the use of tobacco to cancer was published more than 200 years ago and described two patients with nasal cancer, both heavy users of snuff.[2] Since that time, more than 600 documented cases of oral, pharyngeal or laryngeal cancer directly linked to smokeless tobacco use have been reported in North American medical and dental journals.[8] One very unusual case of cancer directly linked to the use of snuff was reported by Root[12]: squamous-cell carcinoma of the concha of the left ear developed in a 58-year-old Minnesota farmer subsequent to his placing snuff in that ear daily to weekly for 42 years.

The most frequently cited epidemiologic study on the relation of smokeless tobacco to oral cancer was conducted by Winn and co-workers.[13] This case-control study in North Carolina involved 255 women with oral and pharyngeal cancer and 502 controls. The study showed that women who used snuff had a fourfold increased risk of oral and pharyngeal cancer than those women who never used tobacco in any form. Most striking were the risks associated with cancers arising in the tissues in direct contact with snuff, the cheek and gum. For those subjects who had used snuff for 1 to 24 years the risk was 13-fold. The risk rose to 50-fold for those who had used snuff for 50 years or more. Detailed analyses revealed that no other patient characteristics altered the risks associated with snuff use.

Carcinogens found in smokeless tobacco include polonium (a known radioactive α-emitter and radiation carcinogen) and two classes of powerful chemical carcinogens: polycyclic aromatic hydrocarbons and the nitrosamines. The most highly concentrated carcinogenic agents found in smokeless tobacco, however, are the tobacco-specific nitrosamines (formed from the tobacco alkaloids during processing).[14] The federal government has established strict levels for human exposure to certain nitrosamines in many consumer products—that is, 10 ppb total volatile nitrosamines in baby bottle nipples and 5 ppb in cured meats.[15,16] However, the concentrations of the four most common tobacco-specific nitrosamines in the five most popular brands of US snuff range from 9,600 ppb to 289,000 ppb.[10] Of particular interest is the finding that the levels of these nitrosamines in smokeless tobacco far exceed levels in other tobacco products.[11,14,17]

In addition to its relationship to cancer, smokeless tobacco appears to play a role in other areas of human health. Nicotine exposure in the habitual smokeless tobacco user is similar in magnitude to that of the cigarette smoker.[18] Although the cardiovascular effects of smokeless tobacco have not been studied in great detail, some information has been reported in the literature. In one study conducted by Squires and colleagues,[19] significant increases in heart rate and blood pressure were reported in 20 subjects given a 2.5-gram dose of smokeless tobacco. In a separate study, Schroeder and Chen reported "a direct and positive relation between smokeless tobacco use and higher blood pressure readings, particularly among young men aged 18 to 25."[20]

Of related concern is the sodium content of smokeless tobacco products. Hampson analyzed 16 retail brands of smokeless tobacco for sodium content.[21] The mean sodium content was found to be 1.76% by weight compared to such foods as dill pickles (1.43%) and cured, fried bacon (1.09%). The latter two items traditionally are considered high in sodium. Other health effects of smokeless tobacco products include hyperkeratosis, gingivitis, gingival recession, tooth abrasion, leukoplakia and nicotine addiction.[7,22-26]

An additional hazard of smokeless tobacco use may be its tendency to encourage and hasten cigarette smoking among young persons. In our survey of high school students, 72.1% of the students who reported using smokeless tobacco at least once also reported smoking at least one cigarette. Only 14.2% of those who reported never using smokeless tobacco had smoked one or more cigarettes. Robert N. Hoover, MD, of the National Cancer Institute has suggested that snuff users may switch to the more socially approved cigarettes as they become adults because adult society does not approve of smokeless tobacco use.[27] If this is true, the most dangerous aspect of smokeless tobacco use may be its role in promoting a behavior proved to cause heart and lung disease, cancer and a wide variety of other ailments.

Interventions

The reduced prevalence of adult male smoking has resulted from the combined educational efforts of individual physicians, public health agencies and voluntary health organizations. The first step in this national antismoking effort was to provide the public with information regarding the dangers of smoking. Although knowledge by itself may not produce behavior change, it is a necessary component. Currently the public does not have adequate information on the risks of smokeless tobacco.

Physicians must begin by dispelling the myth that smokeless tobacco is a benign and safe alternative to smoking. The US Surgeon General has stated that a very effective way to reduce cigarette smoking is for physicians to give clear and simple messages to their patients.[17] The ability of physicians and dentists to reduce smokeless tobacco use should be equally potent. Physicians should look particularly for signs of smokeless tobacco use in high-risk subgroups of the population. Counseling and education can be initiated by simply informing a patient that snuff-related lesions are apparent. Then the patient should be asked what he or she knows about the health consequences of smokeless tobacco use. The physician should fill in any gaps in the patient's understanding

by discussing leukoplakia, oral cancer and periodontal disease.[28] Telling patients that smokeless tobacco use may cause cancer or receding gums is less effective than explaining *how* it is doing so in the mouth of the patient. Such counseling is extremely simple, yet can be very effective. Subsequent visits by the patient should include follow-up counseling sessions concerning tobacco use.

Physicians and other health care providers must never underestimate their ability to promote behavior change in their patients. Schools of medicine, dentistry and nursing should assist students by providing specific instruction on counseling the smokeless tobacco user and the cigarette smoker.

Physicians have the additional role of providing leadership for collective societal interventions. Individual physicians and state and county medical associations should encourage governmental agencies to reduce the smokeless tobacco problem by increasing excise taxes, restricting sales to minors and banning advertisements which create the false impressions that smokeless tobacco use is "macho" and totally safe.

Requiring prudent warning labels is an additional deterrent strategy. Massachusetts recently required all snuff sold in that state to carry the label "Warning: Use of snuff can be addictive and can cause mouth cancer and other mouth diseases."[26] The fear that each state may enact legislation requiring similar warning labels may be one reason the smokeless tobacco industry is supporting warning label legislation on the federal level.

Future Research

There is still much to learn about smokeless tobacco. Future research must clarify the relationship between adolescent smokeless tobacco use and cigarette smoking. Public health officials should determine if the effective components of smoking cessation and school-based smoking prevention programs are as effective in dealing with smokeless tobacco. There is a need to determine the public's current perceptions of the risks and perceived benefits of smokeless tobacco. The impact of smokeless tobacco advertising on youth should be documented. Long-range prospective studies could strengthen causal links between smokeless tobacco use and cancer and periodontal disease.

Such prospective analyses take time and will not be available for many years. In the meantime, the evidence is strong enough for the medical community to make confident statements regarding the dangers of smokeless tobacco use. Our national experience with smoking suggests volumes of scientific data concerning the harmful effects of smokeless tobacco will begin accumulating rapidly now that we have sufficient reason for concern. We know enough now to warn patients of specific risks associated with smokeless tobacco products.

Effective health education programs seek to influence social norms as well as individual behaviors. The history of cigarette use shows that it becomes more difficult to change unhealthy behaviors once they become acceptable norms for large portions of the population. Based on burgeoning smokeless tobacco sales in the past decade, it is apparent that the longer the medical community waits before addressing this issue, the more difficult will be the battle. The time to act is now.

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